

Durable Silver Mirror Coating Via Ion Assisted, Electron Beam Evaporation For Large Aperture Optics, Phase I

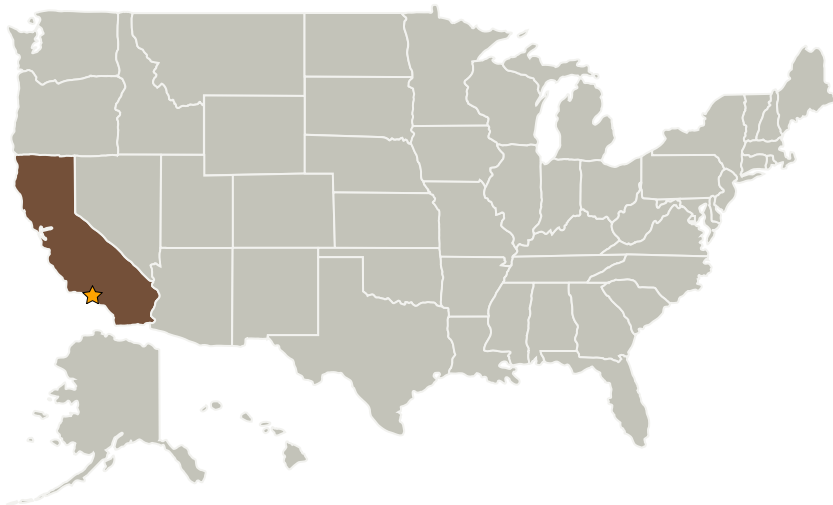
Completed Technology Project (2004 - 2004)



Project Introduction

Highly reflective optical coatings with low scatter properties are needed to image very faint objects such as extra-solar planets. Silver has the highest reflectivity of all metals but tarnishes readily upon exposure to atmospheric pollutants. In this research, Surface Optics Corporation (SOC) will develop a non-tarnishing silver mirror coating based on an ion assisted, thermal evaporation process. The recipe for this durable silver mirror system was patented by Lawrence Livermore National Laboratory (LLNL) and is based on an alternative deposition method, namely, reactive sputtering. Developing a methodology to manufacture protected silver by ion assisted evaporation will allow these proven designs to be fabricated with SOC's large aperture coating facility. SOC recently developed and implemented a unique vacuum coating system that utilizes a computer controlled, translating evaporation source. This system is capable of producing highly uniform optical films with low scatter properties, on curved substrates up to 3-meters in diameter. The combination of SOC's novel coating methods and LLNL's novel coating designs, will establish a unique and very valuable coating resource for the astronomical community.

Primary U.S. Work Locations and Key Partners



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Organizational Responsibility

Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

Lead Center / Facility:

Jet Propulsion Laboratory (JPL)

Responsible Program:

Small Business Innovation Research/Small Business Tech Transfer

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| Organizations Performing Work | Role | Type | Location |
|----------------------------------|-------------------------|-------------|-----------------------|
| ★ Jet Propulsion Laboratory(JPL) | Lead Organization | NASA Center | Pasadena, California |
| Surface Optics Corporation | Supporting Organization | Industry | San Diego, California |

Primary U.S. Work Locations

California

Project Management

Program Director:

Jason L Kessler

Program Manager:

Carlos Torrez

Principal Investigator:

David Sheikh

Technology Areas

Primary:

- TX08 Sensors and Instruments
 - └ TX08.2 Observatories
 - └ TX08.2.1 Mirror Systems